

What is claimed is:

1. A three-dimensional image display device,  
comprising:

5 a display panel which has a plurality of pixel  
sections each of which included a pixel displaying an image  
for the left eye and a pixel displaying an image for the  
right eye, said pixel sections being provided periodically  
in a direction; and

an optical unit that consists of a plurality of  
10 lenses that refract light emitted from said pixels,

wherein said optical unit refracts the light emitted  
from said pixels and emits the light in directions different  
from each other to make the light from different pixels  
incident to the right and left eyes of a viewer and to allow  
15 said viewer to recognize a three-dimensional image, and the  
lens pitch of said optical unit is 0.2mm or less.

2. A three-dimensional image display device,  
comprising:

20 a display panel which has a plurality of pixel  
sections each of which includes a pixel displaying an image  
for the left eye and a pixel displaying an image for the  
right eye, said pixel sections being provided periodically  
in a direction; and

an optical unit that consists of a plurality of  
25 lenses that refract light emitted from said pixels,

wherein said optical unit refracts the light emitted  
from said pixels and emits the light in directions different  
from each other to make the light from different pixels

incident to the right and left eyes of a viewer and to allow said viewer to recognize a three-dimensional image, and when the distance between the longest line segment out of line segments, which are parallel with the line segment  
5 connecting the pixels displaying said image for the left eye and the pixels displaying said image for the right eye, in a three-dimensional visible range from which said viewer can recognize the three-dimensional image, and the surface of said optical unit is set to OD (mm) and the lens pitch of  
10 said optical unit is set to L (mm), said distance OD is 350mm or less, and said distance OD and said lens pitch L satisfy the following expression.

$$L \leq 2 \times OD \times \tan(1')$$

3. A three-dimensional image display device,  
15 comprising:

a display panel which has a plurality of pixel sections each of which includes a pixel displaying an image for the left eye and a pixel displaying an image for the right eye, said pixel sections being provided periodically  
20 in a direction; and

an optical unit that consists of a plurality of lenses that refract light emitted from said pixels,

wherein said optical unit refracts the light emitted from said pixels and emits the light in directions different  
25 from each other to make the light from different pixels incident to the right and left eyes of a viewer and to allow said viewer to recognize a three-dimensional image, and the

lens pitch of said optical unit is 0.124mm or less.

4. A three-dimensional image display device,  
comprising:

a display panel which has a plurality of pixel  
5 sections each of which includes a pixel displaying an image  
for the left eye and a pixel displaying an image for the  
right eye, said pixel sections being provided periodically  
in a direction; and

an optical unit that consists of a plurality of  
10 lenses that refract light emitted from said pixels,

wherein said optical unit refracts the light emitted  
from said pixels and emits the light in directions different  
from each other to make the light from different pixels  
incident to the right and left eyes of a viewer and to allow  
15 said viewer to recognize a three-dimensional image, and when  
the distance between a point in a three-dimensional visible  
range, from which said viewer can recognize the three-  
dimensional image and whose distance from the surface of  
said optical unit becomes a minimum, and the surface of said  
20 optical unit is set to ND (mm) and the lens pitch of said  
optical unit is set to L (mm), said distance ND is 213mm or  
less, and said distance ND and said lens pitch L satisfy the  
following expression.

$$L \leq 2 \times ND \times \tan(1')$$

25 5. The three-dimensional image display device  
according Claims 1, wherein said pixel sections consist of  
two types of pixels that are the pixels for the right eye

and the pixel for the left eye.

6. The three-dimensional image display device according to Claims 1, wherein said optical unit is a lenticular lens.

5           7. The three-dimensional image display device according to Claims 1, wherein said optical unit is a fly-eye lens.

8. The three-dimensional image display device according to Claims 1, wherein said display panel is a  
10 liquid crystal display panel.

9. The three-dimensional image display device according to Claims 2, wherein said pixel sections consist of two types of pixels that are the pixels for the right eye and the pixel for the left eye.

15           10. The three-dimensional image display device according to Claims 2, wherein said optical unit is a lenticular lens.

11. The three-dimensional image display device according to Claims 2, wherein said optical unit is a fly-  
20 eye lens.

12. The three-dimensional image display device according to Claims 2, wherein said display panel is a liquid crystal display panel.

13. The three-dimensional image display device  
25 according to Claims 3, wherein said pixel sections consist of two types of pixels that are the pixels for the right eye and the pixel for the left eye.

14. The three-dimensional image display device

according to Claims 3, wherein said optical unit is a lenticular lens.

15 15. The three-dimensional image display device according to Claims 3, wherein said optical unit is a fly-eye lens.

16. The three-dimensional image display device according to Claims 3, wherein said display panel is a liquid crystal display panel.

10 17. The three-dimensional image display device according to Claims 4, wherein said pixel sections consist of two types of pixels that are the pixels for the right eye and the pixel for the left eye.

15 18. The three-dimensional image display device according to Claims 4, wherein said optical unit is a lenticular lens.

19. The three-dimensional image display device according to Claims 4, wherein said optical unit is a fly-eye lens.

20 20. The three-dimensional image display device according to Claims 4, wherein said display panel is a liquid crystal display panel.

21. A portable terminal device, comprising the three-dimensional image display device according to Claims 1.

25 22. A portable terminal device, comprising the three-dimensional image display device according to Claims 2.

23. A portable terminal device, comprising the three-dimensional image display device according to Claims 3.

24. A portable terminal device, comprising the

three-dimensional image display device according to Claims 4.

25. The portable terminal device according to Claim 21, wherein said device is any one of a cellular phone, a personal information terminal, a game machine, a digital camera, and a digital video camera.

26. The portable terminal device according to Claim 22, wherein said device is any one of a cellular phone, a personal information terminal, a game machine, a digital camera, and a digital video camera.

10 27. The portable terminal device according to Claim 23, wherein said device is any one of a cellular phone, a personal information terminal, a game machine, a digital camera, and a digital video camera.

15 28. The portable terminal device according to Claim 24, wherein said device is any one of a cellular phone, a personal information terminal, a game machine, a digital camera, and a digital video camera.

20 29. A lenticular lens where a plurality of cylindrical lenses are arrayed such that longitudinal directions thereof are parallel with each other, wherein the lens pitch of said cylindrical lenses is 0.124mm or less.